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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/801,821

06/22/2004

Fumio Koyama

111587.01

2538

25944

7590

01/20/2006

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EXAMINER

MULPURI, SAVITRI


ART UNIT

PAPER NUMBER

2812

DATE MAILED: 01/20/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	Application No. 10/801,821	Applicant(s) KOYAMA ET AL. 	
	Examiner Savitri Mulpuri	Art Unit 2812	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 09 November 2005.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-10 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-10 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

### **DETAILED ACTION**

This action is in response to the applicant's arguments filed on 11/9/2006. All the rejections in the previous office action, mailed on 8/18/2005, are maintained same as before.

#### ***Response to Arguments***

Applicant's arguments filed 11/9/2005 have been fully considered but they are not persuasive. Applicant argues that none of the applied references teach or suggest the instant claimed process including "except for plurality of specific oscillation modes" as in claim 1 or "single light emitting region " as in claim 6 or "the media of the surface , which forms a light emitting region has different refractive index than the refractive index of the surface layer of a neighboring light emitting region" as claimed in 6. However, nowhere in the instant disclosure teach suppressing the oscillation modes except for plurality of oscillation modes. In the instant invention only covers single oscillation mode using five holes or nine holes, which result emission with single oscillation mode but not plurality of oscillation m odes (see fig. 6 right side with hole , and fig. 10 , para 0101, para 0102) . The applied reference teaches all the instant claimed process including lower reflection "5" layer active layer "1"and upper reflection layer "3", etch stop layer "2" and surface layer "4" , where upper reflection is etched to form post portion . As agreed by applicant, Kapon et al specifically teach suppressing all modes but to emit only super mode(see col.3, lines 22-28,

para0037). Applicant argues that Kapon et al teaches a plurality of VCSELs but not single light emitting region, which is not valid. Though Kapon forms several VCSELs, Kapon characterize the invention with respect to single VCSEL.

Applicant argues that Kapon does not teach different refractive index. However refractive index is different in the light emitting region where there is air gap "6" compared to the grid "4"

Since instant claims are not limited to the surface layer and etch preventing layer are formed of semiconductor materials, the instant claims are still rejected by applied references. Since instant claims are not limited to how boundary region is formed as specified in the instant specification, where it covers the boundary region is formed of holes or grooves, the instant claims are still rejected by applied references.

Applicant argues that Martinson et al teaches transverse mode selection in large area oxide-confined vertical cavity surface emitting laser by etching a shallow surface relief. Martinsson et al teaches VCSEL with lower reflection layer, active layer, upper reflection layer, where upper reflection is etched to form a post and forming surface layer on the surface of the upper reflection layer and forming holes in the surface layer and forming grooves in the upper portion of the upper reflection layer for producing single oscillation mode. As modified by the teaching of Shieh for forming etch preventing layer on the upper surface of the reflection layer, Martinson et al would include all the limitations in the instant claims.

**THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Savitri Mulpuri whose telephone number is 571-272-1677. The examiner can normally be reached on Mon-Fri from 8 a.m. to 4.30 p.m..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Lebentritt, can be reached on 571-272-1873. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only.

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For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Savitri Mulpuri  
Primary Examiner  
Art Unit 2812